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FURTHER NOTES ON PAST PERIODS OF EELGRASS SCARCITY

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SINCE my paper on Past Periods of Eelgrass Scarcity was published in RHODORA (Vol. 33, pp. 261-264), July, 1934, a few more records have been obtained. A factor of wide distribution appears to have been responsible for some of these records while peculiar local conditions seem adequate to account for other periods of local subnormal production. All evidence still indicates that probably no period of eelgrass scarcity in the history of our country can be compared in intensity, duration, or completeness with the present catastrophe. Additional evidence further indicates that the 1893-94 period was one of general scarcity of the plant along the Atlantic coast of North America. Furthermore, the conditions at that time seem to have been more unfavorable than those of any other period except the present one, which became so widespread and complete in 1931-32 and has continued to the present.

In Rod and Gun in Canada, February, 1934 (Vol. 35, No. 9, p. 20) C. I. McNab, writing of early conditions of marine wild fowl, says, "Regarding the disappearance of eelgrass, I remember about forty years ago [1893-94] the eelgrass disappeared in a similar manner [as it has done since 1931], but I cannot recall what effect it had on game and rifle. It took five or six years to get back to normal again and I believe that within the two years we shall have a good supply." This confirms records given in the summary above referred to and it also coincides with numerous verbal reports of many of the older coastal fishermen and sportsmen with whom I have recently conversed.

In a letter of January 25, 1935, Dr. Robert Lami, Assistant in the Laboratoire de Cryptogamie, Paris, France, gives further support to

our data that the period 1893-94 was one of wide destruction of eelgrass. He states that in France it seems likely that an important period of eelgrass diminution occurred 40 years ago; however, he assures us that it was less complete than the present one and not so extensive. He further reports that in a large bay in Portugal where a part of the people earn their living from the gathering and marketing of eelgrass there has never in the memory of man been a period of scarcity.

New evidence suggests the possibility that abnormal local conditions may have been responsible for the local diminution of *Zostera*. Among these factors may have been extreme cold, which may have caused the ice to cut the green leaves of the plant and so retard growth in certain shallow areas; or severe storms, which may have covered shoals with sand or cut new inlets, thereby abruptly increasing the salinity in an area where the particular flora was adapted to quite different conditions.

Lord Ilchester, in "Swans and Grass Wrack," *The Field* (London), October 21, 1933, 162 (4217): 1037, gives examples of diminution of the plant in the British Isles resulting from extreme cold weather. In refuting an earlier article that appeared in the same magazine attributing a previous scarcity of *Zostera* to the disease that is now believed to be responsible for the present malady, he states that in the winter of 1878-1879 and also 1880-1881 extreme and unprecedented cold caused widespread destruction of the plant along the shallow coastal section of Great Britain and that he did not believe this was traceable to any other factor.

While doing recent field work along our Atlantic coast from southern North Carolina to the Bay of Fundy between the eastern extremity of Maine and Nova Scotia, I received numerous but often vague and indefinite reports of past periods wherein there was a scarcity, or at least a subnormal crop, of eelgrass. One of these reports was of more than ordinary interest. R. C. Walker, who formerly lived at Ocean City, Md., told of an abrupt decrease of the plant in Isle of Wight and Assawoman Bays in 1921 following a very severe storm, which made new inlets connecting the bays with the ocean. He stated that the plant was more than two years in recovering. It seems probable that the abrupt increase of salinity, and perhaps also shifting ocean sands, rather than disease may have destroyed or retarded the growth of plants accustomed to more dilute concentrations of sea water. Mr. Butcher in writing in the *Journal du Conseil* (Vol. 9, No. 1, April,

1934, Conseil Permanent International pour l'Exploration de la Mer; *Zostera*, Report on the present condition of Eelgrass on the coast of England, pp. 49–65) states that two definite periods of decrease in *Zostera* can be distinguished. One of them was immediately after the war (about 1920) and the other in 1931–32 when the plant so nearly disappeared from the American Atlantic coast. The first period of diminution was gradual and therefore not widely noticed while the second was abrupt and more widespread and therefore more conspicuous.

In the abstracts of the proceedings of the Linnean Society of New York for 1931 and 1932, published November 15, 1934 (pp. 40–43), Charles A. Urner, in writing of the eelgrass blight of the New Jersey coast, states that in Barnegat Bay he noticed "as early as 1929 that the drift was reducing in volume and that the dense beds of floating eelgrass in the cover, attractive as a feeding ground to many shore-birds, were becoming less extensive each summer." He stated, however, that the greatest damage to the eelgrass occurred in 1931 and 1932.

From recent observations along the coast it is apparent that in most sections conditions are still very unsatisfactory. Areas of reduced salinity in most places are making the best return. Improvement also is more noticeable in the southern half of the eelgrass range than it is farther north.

Chesapeake Bay shows an encouraging change, with a few localized areas fast approaching the normal. A progressive improvement for more than a year also has been noted in Shinnecock and Mecox Bays, Long Island, N. Y., while a less noticeable improvement is found in Pamlico Sound and Swanquarter Bay, North Carolina. Most of the more open coastal bays from Virginia northward showed little improvement during the past year. In a few areas conditions are worse than they were a year ago, while many others show little or no change. Considering the coastal area as a whole some improvement is noticeable, with the best progress in areas of reduced salinity and in more southern latitudes. Reports from several countries of Europe indicate that eelgrass conditions are still very bad there, yet perhaps slightly improved over those noted a year ago. The causative factor or factors for this unprecedented catastrophe are not positively known, though the evidence seems to point to a fungoid disease, possibly a Mycetozoan.

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